REPORT ON THE HUNSUR SILOS.

During the months of April, May and June 1884, four Silos were constructed at the Hunsur Public Cattle Depôt of the following dimensions :—

No. 1.—Hunsur North Silo ; length 32 feet, breadth 12 feet, depth 8 feet, cubical contents 3,072 feet.

No. 2.—Hunsur South Silo ; length 32 feet, breadth 12 feet, depth 10 feet, cubical contents 3,840 feet.

No. 3.—Kodigahalli North Silo ; (dimensions the same as No. 1).

No. 4.—Kodigahalli, South Silo ; (dimensions the same as No. 1).

The sides and bottom were levelled, and a cement, made of 2 parts finely sifted sand and 1 part chunam, was spread on to the thickness of about an inch.

Silo No. 1 was filled on 1st and 2nd November 1884 with 14½ acres khardu grass and 1 acre of cholum; the grass was a very poor crop and was cut while in flower.

An elephant was used to trample down the grass as it was put into the silo and after filling it up level with the ground a layer of dry grass about 4 inches thick was put on the top, and the whole again firmly trampled down.

Next came a layer of Honge (karanj) branches cut and placed so as not to interfere with the sinking of the grass, and on the top of these was placed about 34¾ tons of stone, or a little over 200 lbs. to the square foot ; then the silo was covered with about a foot of dry earth which was well rammed into the holes between the stones.

An iron gas pipe was forced down to the bottom at the centre of the silo, and the temperature taken daily ; it gradually rose until the 19th November, when it reached its highest point, *viz.* 113°, and after the 19th November it gradually decreased.

Silo No. 2 was filled on 2nd, 3rd and 4th November 1884 with khardu grass, but layers of marwadi, sunti, hanchi and hariyali grasses were also put in for experiment ; this silo was trampled by the elephant and weighted in the same manner as Silo No. 1.

Silo No. 3 was filled in the same manner, but was weighted with earth only.

Silo No. 4 was filled gradually, a layer of green grass was put in every other day and it took about ten days to fill it ; this silo was weighted with earth only and was not trodden down by the elephant.

All the silos were roofed in with a rough thatch to protect them from rain.

The grass was cut in fine weather, but that cut and put into the silos in the early mornings was soaking wet with dew.

Silo No. 1 was opened on 30th March 1885, and the grass was found to have sunk down about 3 feet, leaving 1,920 cubic feet of solid fodder ; the whole of the contents were perfectly good with the exception of about 3 inches round the sides, which was mouldy.

As an experiment the ensilage was offered to cows, bullocks and horses and they all greedily.

This ensilage was issued to the working and other bullocks at Hunsur from the 30th March to 25th May 1885 at the rate of 30 lbs. per head, they ate it readily and up to the present time they are in excellent condition; in fact the working bullocks are in better condition than they have been at any time during the last 2 years; this improvement is clearly attributable to their being fed on ensilage, as they have had no grazing for the last 2 months.

Silo No. 4 at Kodigahalli was opened on 20th April 1885 and was found to be perfectly good, with the exception of about 10 inches at the top, which was mouldy, the weight per cubic foot was only 23 lbs or a total of 19 tons, 14 cwts and 32 lbs, being 14 tons, 9 cwts and 48 lbs less than the contents of silo No. 1, which is of the same size and weighed 40 lbs per cubic foot; (this clearly shows the benefit of employing an elephant in treading down the grass); this ensilage was issued to the Home herd during the month of May 1885.

Silo No. 2 was opened on 26th May 1885 and was found to be equally good, if not better than the others; it weighed 40 lbs per cubic foot and had sunk down 3½ feet, leaving 2,496 cubic feet of solid fodder; this is at present being issued to the working and other bullocks at Hunsur.

Silo No. 3 at Kodigahalli has not yet been opened, but is reserved for the young steers which will be taken over from the Amrut Mahal Department this year; the contents of this silo may be estimated to weigh about the same as Silo No. 1.

Although the ensilage was found to weigh about 40 lbs per cubic foot on being opened, it was proved by experiment that a great loss of weight took place by driage, and credit was given for the ensilage in the stock return for Silo No. 1 at an average rate of 30 lbs per cubic foot; No. 3— 30 lbs per cubic foot; and No. 4— 20 lbs per cubic foot, a statement of the result of the experiment made is appended.

The work of excavating and roofing the silos was done by the cattle attendants, and the only expenditure entailed was the sum of Rs. 185—6—0 paid to coolies for cutting the grass.

A statement showing the cost per ton is also appended.

The result of these experiments is in most respects highly satisfactory.

If the fodder is compared with the hay made of grass from the same paddocks, the superiority of the ensilage is unquestionable; cattle which refused the hay ate the ensilage with avidity and in many cases preferred it to paddy straw when both were placed within their reach.

In my opinion the object to be attained is to produce sweet ensilage on the system of Mr. Fry, whose experiments during the past 2 years have shown that it is by permitting the temperature to rise to or over 120° F., that fermentation is arrested and this is attained by gradual filling of the silo. Complete exclusion of air is necessary to preserve the fodder, but is not the primary cause of averting fermentation.

When Silo No. 1 was opened, the ensilage was entirely devoid of any bad smell, but when cut out in blocks it soon became offensive, and after the silo had been opened a few days a very powerful odour was emitted. When the ensilage was spread out immediately and dried as hay, no bad smell was perceptible.

The loss by evaporation as stated in the return appended shows that 45 lbs of fresh ensilage contains about 31 lbs of water. Complete evaporation seems to have been effected in about a couple of days, after which, the weight was reduced to 14 lbs per cubic foot.

The expenditure was entirely for cutting the grass by coolies, which will be reduced when the mowing machine indented for next year is received.

It is proposed to repeat and extend these experiments during the present year, when an endeavour will also be made to test the feeding capabilities of ensilage as compared with hay and straw by feeding equal numbers of cattle fed upon each description of fodder.

I am glad to state that the preparation and filling of the silos was very carefully carried out by the Amildar.

Statement showing the weights of 3 cubic feet of ensilage after being exposed to the sun for several days.

	Date.	1 cubic foot tied up. lbs.	1 cubic foot spread out loose. lbs.	1 cubic foot spread out loose. lbs.	Remarks.
	1885.				
Silo No. 1.	March 30th	...	42	45	
	Do 31st	47	40	33	
	April 1st	44	16½	16	
	Do 2nd	42	14	14	
	Do 3rd	40	14	14	
	Do 4th	39	14	14	
	Do 5th	37	14	14	
	Do 6th	36	14	14	
	Do 7th	35½	...	...	
	Loss by driage.....	11½	28	31	

Statement showing the cost of ensilage at Hunsur during 1884—85 after deducting loss by driage.

	Cubic feet of ensilage.	Weight per cubic foot.	Total weight. Tons.	Cwts.	lbs.	Rate per ton.			Total cost.			Remarks.
Silo No. 1	1,920	30 lbs.	25	14	32	...	...	...	...	...	...	
Do 2	2,496	30 lbs.	33	8	64	...	...	...	...	...	...	
Do 3 (estimated) ...	1,920	30 lbs.	25	14	32	...	...	...	...	...	...	Not yet opened.
Do 4	1,920	20 lbs.	17	2	96	...	...	...	...	...	...	Not trodden down by elephant.
Total cubic feet.....	8,256	Tons.	102	0	0	1	13	1⅗	185	6	0	

A. C. HAY, *Colonel*,
In charge, Hunsur Public Cattle Depôt.

Report on the Silos excavated and filled on the Farm, Rambân land, Herur and Nademavinpur Kavals **and the results when opened.**

Silo No. 2—Was excavated and got ready by the 24th October, the filling was commenced on the h, early in the morning; three feet of good hariyali mown off Paddock No. 4 was put in for the first and was well trampled down by women. After this the sorghum grown in Paddock No. 3, an of 4 acres, was cut and chaffed in the chaff cutter and put in, being gradually trampled by women. filling work was done on the 25th, 26th and 27th, the last layer being good hariyali; the closing of lo was done on the 28th, and as the mass sank it was attended to; the earth excavated from it for the weighting of the mass. The dimensions are 14 feet × 11 feet × 10 feet and the contents 540 cubic feet. On the morning of the 19th of March, the silo was opened, the earth covering on ce being removed, the mass had sunk two feet, equivalent to 308 cubic feet (14′ × 11′ × 2′). On ving the bamboo mat laid over the silage before weighting with earth, it was found that the first of hariyali grass was of a dark green color and after airing out some of it, it was found to be like made hay. The sorghum was found to be also fresh and green; containing a good deal of sap were given to the mares and foals; the hariyali was eaten with avidity by them, but they re- the sorghum on account of the moisture and had it since. The cattle were next tried and every o which it was offered ate it. The quantity of sorghum and hariyali in this silo was weighed; of ormer there was 16,168 lbs and the latter 5,730 lbs, a total of 21,898 lbs. Four days after open- it, it was found to contain minute worms, which had been deposited by flies through the bad smell, nd since the 23rd March it is being used for the cattle. The cost of excavating this silo was Rs. 5—4 —0 as the bottom contained soft rock, and the cost of cutting, chaffing trampling and weighting was Rs. 11—8—0, total Rs. 16—12—0.

Silo No. 3—Excavated on the Rambanhanta land, opposite the village of Maisanhalli on the 2nd November; the filling commenced early on the morning of the 5th when the d on th grass fresh. The filling was done on the 5th, 6th and 7th with the best h the 8th the mass was weighted with earth excavated from the silo.

14′ × 10′ × 8′ and the contents being 1,120 cubic feet. On the 23rd March it was opened and the sinkage was 1¼ feet or 175 cubic feet. On cutting out a square piece in the middle, it was found to be of a black color and had a very sour smell. After cutting to a depth of 2½ feet, it was ascertained that 1½ feet of silage had the same black color as on the surface; below this depth the grass was found to be fresh and of a better smell. A cubic foot of this fodder was cut out and weighed 15 lbs. Deducting the sinkage there remains 945 cubic feet, containing 14,175 lbs. The grass could not be weighed before being put in; a portion of the black surface grass was given to the cattle and they seem to like it. After ascertaining the results of this silo, it was again shut up. The cost of excavating, filling, cutting grass, weighting, &c. was Rs. 11—12—1.

Silo No. 4—Was excavated on the 5th November near Silo No. 3 ; the filling commenced on the 8th and was finished on the 10th ; the weighting of the mass was done on the 11th morning. This silo was also filled in with good kaval grass. The mass was weighted with the earth excavated from the silo. The dimensions of silo are 14′ × 10′ × 8′ and the cubical contents being 1,120 feet. This silo was not opened. The cost of excavating, filling, cutting grass, weighting, &c. was Rs. 11—12—1.

Silo No. 5—Was excavated near the village of Borlingapalyam on the 13th November ; the filling was commenced on the 14th and was finished on the 19th and weighted on the 20th and 21st with the earth excavated from the silo. The dimensions are 14′ × 10′ × 8′, total cubic contents being 1,120. This silo was not opened. The cost for excavating, filling, weighting, &c. is Rs. 11—12—1.

Silos Nos. 6 *and* 7—Were excavated on the high ground near the village of Kotepura on the side of the high road on the 17th, 18th and 19th November; the filling of the former was commenced on the 26th November and was completed on the 29th. This silo was larger than the rest, the mass was weighted on the 30th with the earth excavated from it. The dimensions are 22 × 14 × 11. The latter was commenced with on the 1st December morning and finished on the 7th. The weighting was done on the 8th, dimensions 16 × 11 × 10. The cubical contents of the former are 3,388 cubic feet. It was opened on the 20th March. The sinkage was found to be one foot from the surface or 308 cubic feet. A block was cut out and the results were indeed very satisfactory; the grass was found to be of a dark color but equal to freshly cut grass; the horse your honor rode ate it all the time it was there with avidity and so did many others to which it was given. Thence Amrut Mahal bulls being sent into Calcutta were given some of it and they also readily ate it. A cubic foot was cut out and weighed 27½ lbs, the pressure was indeed immense. Deducting the sinkage 308 feet, there remains 3,080 cubic feet of solid fodder equivalent in lbs. 84,700; after ascertaining these results the silo was again covered up and ordered to be kept till such time a difficulty was experienced for fodder for the horses. Silo No. 7 was not opened, the dimensions of it are 16′ × 11′ × 10′ and its cubical contents 1,760 feet ; the cost for excavating, filling, pressing and weighting these two silos is Rs. 22—3—6; also a stack of surplus grass was cut and stacked near these silos which served for the use of the farm cattle since the 14th February to 13th March.

Silos Nos. 1 *and* 2.—Amrut Mahal Nademavinpur. The dimensions of the former are 21 feet 12 feet × 6 feet containing 1,512 cubic feet, and the latter 30′ × 12′ × 6′, the cubical contents be 2,160 feet. These silos are situated near the 48th mile stone on the road to Hassan. The former excavated on the 10th and 11th December and the kaval which contained some very good grass marvil, &c., were cut and put in on the 12th, 13th, 14th and 15th December, and the weighti done on the 16th and 17th. The latter was excavated on the 17th and 18th December on co and the filling was done on the 19th, 20th and 21st; the weighting was done on the 22nd. On th March Silo No. 1 was opened, and the sinkage was found to be two feet, the contents of which cubic feet. The top layer was found to be decomposed partly, having a white color, resembling a depth of 4 inches. After removing this, the grass was as good as when newly cut, having a dar color; a block was cut out to see whether the Amrut Mahal cattle which were at that time would eat it; on my recommending that the top layer should be first given them as a trial whether they would eat it, as it was very bad, some was laid before them, when to the satisfa many ryots and gaudas who were present, the cattle ate it greedily; after this the good silage wa with the same satisfactory results, the cattle were so enticed with the vicious smell which came fr silage that they approached near to the silo for some more. A cubic foot was cut out and it w 21 lbs. Deducting the sinkage 504 cubic feet from the total contents of 1,512 cubic feet leave cubic feet of solid fodder containing 21,168 lbs. The latter was not opened. The cost of the silo for excavating, filling, &c., was Rs. 16—13—8 and the latter Rs. 23—9—2.

In conclusion, I beg to report that the results obtained from the silo experiments tried this y have indeed been very satisfactory, and the problem has now been solved, that all surplus grasses o any kind can be safely preserved under ground. If cattle owners took an interest in the welfare of their cattle, they will during a time of plenty store large quantities, which would during seasons of drou blessing to their impoverished cattle when no fodder is to be had at all.

J. GALE, *Overseer.*